CALIFORNIA OAK MORTALITY TASK FORCE
2006 SUDDEN OAK DEATH &
PHYTOPHTHORA RAMORUM SUMMARY REPORT

A Compendium of COMTF Monthly Newsletters

Photo by: K. Frangioso, UC Davis Big Sur, 2006

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2006 SIGNIFICANT EVENTS

- The number of plant species found to be *P. ramorum*-susceptible increases by 20, for a total of 104.

- In coastal California forests, *P. ramorum*-related mortality is at the highest level observed since 2000. Recent estimates suggest that more than a million trees have been killed in CA, with at least another million currently infected. The increased mortality is attributed to above average rainfall and late spring rains in 2005 and 2006, followed by an exceptionally hot summer in 2006.

- In 2006, 35 new *P. ramorum*-infested sites (139 infected tanoak trees) were discovered in Curry County, OR. This is the highest number of detections since the eradication effort began in 2001. Two of the new sites occurred outside of the quarantine zone, with each site more than 2 miles from a known infestation.

- Sixty-two sites in 11 states have nursery-related *P. ramorum* detections. Positive findings by state are: AL (1), CA (28), CT (1), FL (2), GA (1), IN (1), ME (1), MS (1), OR (13), PA (1), and WA (12).

- *P. ramorum* is isolated from asymptomatic root tissue of naturally infected tanoak seedlings.

- Researchers find that sapflow and specific conductivity are significantly reduced in infected tanoak trees, suggesting that interference with water conductance may be a factor in tree mortality.

- A third lineage of *P. ramorum*, distinct from the EU1 and NA1 lineages, is discovered in three nurseries in CA and WA.

- A seasonal stream in Pierce County, WA is confirmed *P. ramorum*-positive. The positive sample was taken in mid-January 2006. It is adjacent to an ornamental nursery found positive for the pathogen in 2004 and 2005.

- Annotations of the *P. ramorum* and *P. sojae* genomes are published revealing that these *Phytophthoras* have an unprecedented number of genes and genetic flexibility compared to fungal pathogens.

MONITORING

The 2005 CA SOD/*P. ramorum* aerial and ground-check survey covered 23 counties in the State and mapped approximately 81,000 acres of hardwood mortality. Targeted ground surveys covered seven CA counties and identified four new findings in Humboldt County, expanding the known infested area for the county to include two additional watersheds. Flyovers did not detect infection in the currently uninfested bordering counties of Del Norte and San Luis Obispo. Additionally, the flyovers made note that vegetation types containing coast live oak have less mortality and fewer confirmations of *P. ramorum*, while those with a tanoak component appear to be increasing both in terms of mortality area and new confirmations. (2/06)

A sample taken from a seasonal stream in the Kitsap Peninsula area of Pierce County, WA has been confirmed *P. ramorum*-positive by the USDA APHIS Beltsville, MD laboratory. The confirmed sample was part of the environmental monitoring project currently being conducted in partnership by WA's Department of Natural Resources and the WSDA as part of the National *P. ramorum* Survey of Forest Environments, Stream Survey Pilot Project.

The sample was taken in mid-January 2006 from a seasonal stream that flows through and adjacent to an ornamental nursery. Plants from the nursery tested positive in 2004 and 2005. In both years, the nursery immediately complied with the USDA CNP. The pathogen was declared eradicated at the nursery according to the 2004 federal protocol. The cause of the reoccurring infestation in 2005 is unknown; however, the nursery immediately moved to comply with CNP upon confirmation. The 2005 results were complicated by a positive soil sample from the immediate area under the infected stock at the nursery; consequently, the 2005 eradication protocol cannot be completed until temperatures warm, allowing for successful soil treatment.

In order to determine the extent of water contamination, the agencies are monitoring the water upstream and downstream from the positive site. Further, to determine whether an infestation exists outside the affected nursery, monitoring for signs of infestation throughout the immediate watershed area will be conducted. USDA APHIS is currently reviewing the WSDA findings to develop an appropriate response to this unusual situation. (3/06)

***P. kernoviae* has been confirmed at two sites in Northland, New Zealand. At one of** the sites, *P. kernoviae* was isolated from cherimoya or custard apple in an orchard. At the second site in Trounson Kauri Park, a soil sample was found positive for the pathogen. The identifications were made as a result of a Ministry of Agriculture and Forestry Operations Research-funded project to determine species of *Phytophthora* present in New Zealand using new DNA technology. To date, Biosecurity New Zealand has not been able to link the infections to imported material. Investigations continue in an effort to determine the pathogen's distribution. (4/06)

Redwood National and State Park (RNSP) has hired two seasonal botanists to implement a SOD Early Detection Survey this spring/summer. The botanists will be

conducting non-random surveys for SOD/*P. ramorum* symptoms within specific areas of the park. The focus of the monitoring will be park areas where host species (in particular tanoak, CA bay laurel, and rhododendron) intersect visitor use areas such as campgrounds, day use facilities, and trails. For a second year, water sampling of key locations within the parks to detect *P. ramorum* in specific watersheds will also be implemented. The combination of aerial, aquatic, and non-random monitoring should give park managers some measure of confidence that if *P. ramorum* is present in RNSP, and likely detect its presence early. (5/06)

***P. ramorum* was detected on dead tanoaks a few miles outside the OR quarantine** area on OR State Parks and Rogue River-Siskiyou National Forest-administered lands near Brookings, OR. This is the first find of *P. ramorum* on USDA FS land in OR. ODF survey crews made the discovery while searching upstream from a stream baiting location found *P. ramorum*-positive last fall. State and FS officials are planning to implement eradication treatments on several acres of land this summer. The infested area will be added to quarantined portions of Curry County, OR. Surveys will continue in the area to find any additional disease centers. (6/06)

***P. ramorum* has been confirmed on California bay laurel in El Sobrante, Contra** Costa County. Pavel Svirha, emeritus advisor from Marin County, first notified county officials of the infestation after *Quercus agrifolia* tree samples he had taken were confirmed *P. ramorum*-positive via laboratory analysis. Follow-up samples of *Umbellularia californica* were taken from the site and submitted to CDFA for analysis. The California bay laurel leaves were also found positive for *P. ramorum*. This is a new location for SOD in northwestern Contra Costa County. (6/06)

The first *P. ramorum*-positive beech in the Netherlands was reported on 6/16/06. The findings were made by Ministry of Agriculture, Nature Management, and Fisheries researchers in the municipalities Oath and Nijmegen. Symptoms included stem bleeding. This is the first time a plant species native to the Netherlands has been identified with the pathogen. At both locations the affected beech were surrounded by heavily infected rhododendrons. (7/06)

The UK Forestry Commission is conducting three surveys this year to determine the current status of *P. ramorum* and *P. kernoviae* in England and Wales. The effort is a result of a 2005 Interdepartmental *Phytophthora* Program Board agreement that the high- and low-risk woodlands in England and Wales which are growing among *Rhododendron ponticum*, and which had been surveyed by the Forestry Commission in 2004, should be resurveyed over five years to determine whether they are still disease-free. The first of the surveys, the National Re-survey of England and Wales, took place during 7/05 and 8/05, with no positive findings in the 149 woodlands inspected. This year's survey began in late June and will continue until late August. To date, the main outbreak area for both *Phytophthoras* has been in Cornwall. This year DEFRA extended the program to include previously unsurveyed locations, which the Forestry Commission supplemented with an additional 14 previously unsurveyed sites. These additional surveys have resulted in the identification of a *P. ramorum* outbreak in Devon, near the Cornish border. As a result, the Commission will survey more of the Devon woods to determine if *P. ramorum* is

more extensive there than just the newly identified outbreak, as well as if *P. kernoviae* is present. (7/06)

During 6/06 and 7/06, the USDA FS and Cal Poly San Luis Obispo conducted aerial surveys to map oak and tanoak mortality in Mendocino, Humboldt, Del Norte, San Luis Obispo, western San Benito, and Santa Barbara Counties. Western Monterey was also surveyed as part of the Big Sur SOD Management Program. In total, approximately 20,000 acres of mortality were mapped, 9,000,000 acres surveyed, and 6,667 miles flown. Follow-up ground-check surveys, gathering symptomatic vegetation samples for laboratory diagnosis, are still underway. Results received so far from CDFA and the UC Davis Rizzo lab show two new *P. ramorum* confirmations in southern Mendocino County in the Indian Creek and Navarro River watersheds between Ukiah and Booneville. (8/06)

The 2006 USDA FS National Early Detection Survey for *P. ramorum* in Forest Environments is underway. To date, three out of 36 cooperating states have completed field work, and nearly 500 locations have been surveyed nationally. About 1,100 samples have been submitted, with nearly half having diagnostics complete, and all results negative for *P. ramorum*. Approximately two-thirds of the sites surveyed so far have been nursery perimeter locations. (8/06)

The USDA FS and states are conducting nursery perimeter and general forest detection surveys. To date, 567 nursery perimeter surveys have been conducted in 29 states, with 1,498 samples collected. Additionally, 320 general forest surveys have been conducted in 29 states, with 765 samples collected. To date, all samples tested have been found negative for the pathogen. (10/06)

The USDA FS FHP PSW Region has published their "2006 Accomplishment Report: Aerial and Targeted Ground-Based Monitoring for Sudden Oak Death." The purpose of the FS monitoring effort is to find new *P. ramorum* infestations in uninfested, high-risk counties (Del Norte, San Benito, San Luis Obispo, and Santa Barbara) and in counties with limited pathogen distribution (Humboldt and Mendocino), as well as to support site-intensive projects in the Big Sur region and Humboldt County. In 2006, the FS survey crew confirmed 10 new *P. ramorum* detections - 9 in southern Mendocino County and 1 in southern Monterey County. (2/07)

The USDA FS "2006 National *P. ramorum* Early Detection Survey for Forests" was conducted in 36 states. Of the 1,044 locations surveyed nationwide; 607 were nursery perimeter locations and 437 were general forest locations. All of the 4,016 samples processed were negative for *P. ramorum*.

National water monitoring survey protocols were pilot tested during 2006 in 93 watersheds in 11 states. WA became the first state using national survey protocols to detect *P. ramorum* in a stream not known to be infested. The intermittent stream flowed through a woody ornamental nursery that had previously been confirmed *P. ramorum*-positive. Follow-up terrestrial surveys up- and downstream found no infection of forest

vegetation. The 2007 National *P. ramorum* Early Detection Survey for Forests will employ stream baiting exclusively. (3/07)

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The following 14 citations are from papers to be presented at the 6th California Oak Symposium, Oct. 9 – 12 in Rohnert Park. Abstracts can be found on the Symposium website at: http://danr.ucop.edu/ihrmp/symposium.html.

Abstract 4: Contemporary California Indians, Oaks, and *Phytophthora ramorum* (Sudden Oak Death). Beverly Ortiz, CSUEB/Self/EBRPD

Abstract 16: Woodland Structure Affects Intensity of Infection by an Exotic Forest Pathogen. Nathan Rank, Sonoma State University; Hall Cushman, Sonoma State University; and Ross Meentemeyer, University of North Carolina at Charlotte

Abstract 18: Consequences of *Phytophthora ramorum* Infection in Oaks and Tanoaks. Brice McPherson, University of California; David Wood, University of California; Sylvia Mori, United States Forest Service; Richard Standiford, University of California; and Maggi Kelly, University of California

Abstract 20: Impacts of *Phytophthora ramorum* Canker and Other Agents in Sonoma County. Tedmund Swiecki, Phytosphere Research and Elizabeth Bernhardt, Phytosphere Research

Abstract 22: Susceptibility to Sudden Oak Death in California Bay Laurel. Brian Anacker, Sonoma State University; Nathan Rank, Sonoma State University; Daniel Huberli, UC Berkeley; Matteo Garbelotto, UC Berkeley; Sarah Gordon, Sonoma State University; Rich Whitkus, Sonoma State University; and Ross Meentemeyer, University of North Carolina at Charlotte

Abstract 23: Forest Response to an Emerging Disease: Sudden Oak Death in Coastal California. Letty Brown, University of California, Berkeley and Barbara Allen-Diaz, University of California, Berkeley

Abstract 25: Effects of Recreation on the Dispersal of Exotic Forest Pathogen, *Phytophthora ramorum*. Michelle Cooper, Sonoma State University, Department of Biology and Hall Cushman, Sonoma State University, Department of Biology

Abstract 27: Human Activity and Spread of the Pathogen That Causes Sudden Oak Death. Hall Cushman, Sonoma State University and Ross Meentemeyer, University of North Carolina at Charlotte

Abstract 29: GIS-Based Epidemiological Modeling of an Emerging Forest Disease: Spread of Sudden Oak Death Across California Landscapes. Rich Hunter, Sonoma State University and Ross Meentemeyer, University of North Carolina at Charlotte

Abstract 31: Long-Term Change in Oak Woodlands and Its Influence on a Forest Disease. Ross Meentemeyer, University of North Carolina at Charlotte and Hall Cushman, Sonoma State University

Abstract 33: Gap Dynamics in Oak Woodlands Across a Gradient of Disturbance. Tim De Chant, University of California, Berkeley, Dept. of Environmental Science, Policy and Management and Maggi Kelly, University of California, Berkeley, Dept. of Environmental Science, Policy and Management

Abstract 41: Regeneration of Oaks and Tanoak in *Phytophthora ramorum*-Affected Forests. Tedmund Swiecki, Phytosphere Research and Elizabeth Bernhardt, Phytosphere Research

Abstract 49: Molecular Markers Show How Pollen and Seed Dispersal Affect Population Genetic Structure in Coast Live Oak (*Quercus agrifolia* née). Richard Dodd, University of California; Zara Afzal-Rafii, Universite d'Aix-Marseille III; and Wasima Mayer, University of California

Abstract 59: Determining the Role of Plant Community and Landscape Change in the Sudden Oak Death Disease Complex. Timothy Doherty, University of Berkeley, ESPM; Barbara Allen-Diaz, University of Berkeley, ESPM; and Maggi Kelly, University of Berkeley, ESPM (10/06)

The December 2006 issue of Molecular Plant-Microbe Interactions, "Focus on *Phytophthora* genomics," can be found at: http://www.ismpminet.org/mpmi/current/top.asp. The following eight citations are abstracts from the papers that are *P. ramorum*-relevant.

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RESEARCH

An intradepartmental USDA *P. ramorum* research needs assessment and coordination meeting was held 2/8/06. Officials from USDA's APHIS; FS; ARS; and CSREES met to work on designing complementary research and extension activities and to assemble briefing papers on USDA's *P. ramorum* program. The research gaps identified will be used to steer awarding of funds from the USDA FS 2006 *P. ramorum* RFPs and to update the PSW five-year *P. ramorum* research plan. (3/06)

UK Forestry Commission forest researchers and Italian forest pathologists went on an expedition to Nepal in late 2005 to investigate the possibility of the Himalayas being the geographic origin of *P. ramorum* and *P. kernoviae* as well as to identify any currently unknown *Phytophthora* species that may pose a threat to EU forests. The trek covered 120 km round trip through a coniferous forest made up of blue pine, spruce, cypress and yew, in addition to broadleaved areas comprised of elm, oak, *Lithocarpus*, horse chestnut,

walnut, maple, and areas with understory rhododendron. Samples were taken from plants, streams, and soil. (3/06)

DEFRA has posted a final report to their website on "Conservation (micro-prop) of rare plants from *P. ramorum* infected site in the South West (PH0316)" conducted from 8/19/04 to 8/19/05. The objective of the project was to develop a protocol to micropropagate material from ancient *Rhododendron* and *Camellia* species situated in historic gardens that are potentially infected with *P. ramorum.* The research was initiated because of the outbreak of the pathogen in Cornwall and its threat to the ancient (up to 150 years old) and unique Rhododendrons and Camellias which were introduced by the plant hunters of the mid-19th Century. (3/06)

The USDA FS PSW 2006 *P. ramorum* RFP process is complete. In total, 46 proposals seeking over $5 million in research funds were received. However, due to limited funding, only nine projects were awarded, totaling approximately $665,000. (5/06)

On 4/24/06, WSU celebrated the completion of a new $250,000 biocontainment laboratory at their Puyallup Research and Extension Center. This facility will allow researchers at WSU Puyallup to complete whole plant inoculation studies, increasing the capacity of WSU to address critical research questions relating to the establishment, spread, and management of *P. ramorum.* (5/06)

According the Norwegian Institute for Agricultural and Environmental Research (NIAER), *P. ramorum* surveys along the west coast of Norway indicate the pathogen is more common than previously realized. The following is an excerpted summary from surveys in areas with climates similar to Cornwall, U.K. This information has been submitted to Plant Disease for publication.

In November 2002, NIAER received a sample of *Rhododendron catawbiense* for diagnosis from the city of Bergen, along the west coast of Norway. *P. ramorum* was isolated from the wilted branches. After the first detection of *P. ramorum*, the Norwegian Food Safety Authority started a survey in 2003, and of 21 samples from 10 locations, two were positive. All rhododendron plants containing positive samples from both 2002 and 2003 had been imported the same year the disease was detected on them. The production of rhododendron in Norwegian nurseries is limited, and most rhododendrons marketed in the country are imported in spring from other European countries. The main sale of rhododendron occurs in spring, often before symptoms of *P. ramorum* are easy to observe.

In 2004, a total of 133 samples from 53 locations were analyzed. *P. ramorum* was found in 29 new locations. It was detected in 57 samples of rhododendron, one sample of *Pieris japonica*, and one of *Kalmia* sp. Symptoms on *Pieris* were similar to those on *Rhododendron*, with blighted twigs and leaf spots. On *Kalmia* sp., *P. ramorum* was isolated from small foliar spots. In no case were symptoms detected before June. In 2005, special efforts were directed towards detecting *P. ramorum* before the spring sale.

Between January and May, 142 samples were analyzed (including plants from 45 import shipments), and 19 yielded positive (including 6 samples from 5 import shipments). In total, 370 samples from 74 nurseries were analyzed in 2005, and 97 were positive (all *Rhododendron*). A part of the samples that yielded positives in the summer and autumn came from import shipments or nurseries controlled earlier and found free from *P. ramorum*. As suggested previously, the pathogen is probably moving in trade as symptom-free plants and also likely in batches with few mildly infected plants that are difficult to detect when random control is carried out in large shipments. During 2005, *P. ramorum* was detected on well-establish *Viburnum fragrans* and *Rhododendrons* in a private garden in Bergen. The *Viburnum* plants in this garden were heavily infected, with wilting of whole branches from the base to the top. The *Rhododendrons* in the same garden were apparently healthy, but after a careful inspection, twig dieback was observed on several bushes. The pathogen was also found on established *Rhododendron* shrubs in four public greens in Bergen and two in Stavanger in southwest Norway. (6/06)

The Wildlife Conservation Society report "Sudden Oak Death and *Phytophthora ramorum* risk for Special Status Vertebrates in California, Oregon, and Washington" is now available. The report used a series of models and predictions, including state GAP and wildlife-habitat relationship models, to display where the habitats of wildlife may be at risk of *P. ramorum* infection. The risk assessment encompassed all mammals, birds, reptiles, and amphibians native to California, Oregon, and Washington, with special status at the species, subspecies, or population level. (6/06)

The National Science Foundation/National Institutes of Health (NSF/NIH) program "Ecology of Infectious Diseases" is funding a 5-year, $2.4 million grant for "Sudden Oak Death: Feedback Between a Generalist Pathogen, Hosts, and Heterogeneous Environments at Multiple Spatial and Temporal Scales." Dave Rizzo, Matteo Garbelotto, and Ross Meentemeyer, in collaboration with Christopher Gilligan, are the grant recipients.

The project will examine the environmental and biological circumstances that initially led to the emergence of *P. ramorum* and the subsequent disease-related changes to the forest environment. A combination of field, greenhouse, and laboratory experiments, along with geographical information system and mathematical modeling approaches to research the spatial and temporal dynamics of SOD will be used. How human-induced changes in landscape structure and composition of forests when combined with weather patterns (e.g., El Nino) may have influenced the establishment and spread of pathogen in California forests will also be examined. (9/06)

In response to continued tanoak mortality, a project to evaluate tanoak resistance and genetic make-up is underway. Agencies involved in this cooperative effort include UC Berkeley, the USDA FS, the Midpeninsula Regional Open Space District, and Pt. Reyes National Seashore.

The 2006 acorn crop, while more abundant than last year, is still rather limited; however, collections are being made at five locations from Big Sur to Southern Oregon for

evaluation of tanoak resistance, genetic make-up, and genetic variation in growth characteristics, along with other traits. An off-shoot of the SOD genetics white paper presented at the 3/06 COMTF meeting, this project will focus on developing the protocols and methods that would be needed if a full-scale tanoak resistance program were launched. Any potential future development of *P. ramorum*-resistant tanoak will take five to 10 years and millions of dollars in funding; however, resistance remains one of the most promising management strategies to maintain tanoak populations in wildland areas severely impacted by *P. ramorum.* Project goals also include gaining a greater understanding of tanoak genetic variation in susceptibility to *P. ramorum*, which will aid in understanding pathogen distribution and long-term impacts and risks. (9/06)

NEW HOSTS

Canada posted a list of 5 new genera on 1/18/06 that are found to be associated with, and regulated for, *P. ramorum*. Found in British Columbia nurseries, the new genera are: *Ardisia*, *Euonymus*, *Gaultheria*, *Osmanthus*, and *Prunus*. USDA APHIS is reviewing the findings and anticipates updating the federal *P. ramorum* host and associated host list following completion of the review. (2/06)

***Acer circinatum* (vine maple) and *Arctostaphylos columbiana* (a manzanita)** symptomatic plants have been identified as *P. ramorum*-positive. Both newly identified hosts were found in Humboldt County growing in natural settings. APHIS is reviewing the findings and anticipates adding these two species to the USDA APHIS *P. ramorum* associated host list in the near future. (3/06)

The following 6 plants were added to the official list of *P. ramorum* hosts and associated hosts by USDA APHIS in February 2006. All of the newly identified species were found in one BC, Canada nursery.

- *Acer davidii* – David's maple (Aceraceae) – David's maple was first identified on 11/25/05 in a Canadian nursery. With Koch's postulates not yet completed, it will be added to the USDA APHIS associated host list.

- *Ardisia japonica* – Japanese Ardisia or marlberry (Myrsinaceae) – *Ardisia japonica* was first found *P. ramorum*-positive on 12/14/05 in a Canadian nursery. Since Koch's postulates have not been completed, this species will be added to the USDA APHIS associated host list.

- *Euonymus kiautschovicus* *(E. patens)* – Spreading Euonymus (Celastraceae) – *Euonymus kiautschovicus* was found *P. ramorum*-positive for the first time on 12/8/05 in a Canadian nursery. With Koch's postulates not yet complete, it will be added to the USDA APHIS federal *P. ramorum* associated host list.

- *Gaultheria shallon* – Salal (Ericaceae) – Salal was confirmed positive for *P. ramorum* on 12/20/05 in a Canadian nursery. Since Koch's postulates have not been completed, this species will be added to the USDA APHIS associated host list.

- Hamamelis* X *intermedia – hybrid witchhazel (Hamamelidaceae) – *Hamamelis* X *intermedia* was found *P. ramorum*-positive 7/6/05 in a Canadian nursery. Koch's postulates have not been completed, so this species will be added to the USDA APHIS associated host list.

- Leucothoe axillaries – Coast Leucothoe (Ericaceae) - Coast Leucothoe was confirmed *P. ramorum*-positive on 7/6/05 in a Canadian nursery. Since Koch's postulates have not been completed, this species will be added to the USDA APHIS associated host list. (4/06)

The first finding of *P. ramorum*-infected *Ceanothus thyrsiflorus* (blue blossom) has been confirmed. Found in southern Humboldt County, the infected blue blossom was growing along the road within a *P. ramorum* treatment area in the lower Salmon Creek watershed, west of Miranda and the South Fork of the Eel River.

P. ramorum symptoms were found on the leaves, stems, and shoot tips of the confirmed blue blossom. Leaf symptoms consisted of necrotic lesions developing along the leaf tips and margins. The lesions had dark, irregular margins, and in some cases entire leaves were necrotic. Symptoms also included necrotic lesions on stems and shoot dieback. USDA APHIS is reviewing the findings and anticipates adding *Ceanothus thyrsiflorus* to the federal *P. ramorum* host list soon. (4/06)

***Osmanthus fragrans* (sweet olive) and *Osmanthus heterophyllus* (false holly) have** been found *P. ramorum*-positive. USDA APHIS is reviewing the findings and anticipates adding these species to the APHIS *P. ramorum* associated host list in the near future. Both species were identified following the self-reporting of a Humboldt County nursery with *P. ramorum*-positive *Viburnum tinus*.

Additionally, on 6/9/06, APHIS confirmed *Nerium oleander* (Oleander) as a new *P. ramorum* associated host when delimitation survey samples from the Humboldt County facility were confirmed positive. Symptoms included leaf tip necrosis, with the most symptomatic leaf lesions covering up to a quarter of the leaf area. Lesions on oleander, as with most lesions due to *Phytophthora* infections, were wet and flexible, not dry and crisp. (7/06) and (8/06)

Quercus acuta*- Japanese evergreen oak (Fagaceae) – *P. ramorum*-positive *Quercus *acuta* was found in the UK. Symptoms included bleeding trunk cankers. Consequently, USDA APHIS has added this species to the list of regulated Plants Associated with *P. ramorum.* (8/06)

***Cinnamomum camphora* – camphor tree (Lauraceae) – *P. ramorum*-positive** *Cinnamomum camphora* was found in the UK. Symptoms included shoot tip die-back and stem necrosis or canker. Consequently, USDA APHIS has added this species to the list of regulated Plants Associated with *P. ramorum*. (8/06)

Eucalyptus haemastoma* (Myrtaceae – Myrtle family), *Cornus kousa* x *Cornus *capitata* (Cornaceae – Dogwood family), and *Castanopsis orthacantha* (Fagaceae – Beech family) have been added to the UK DEFRA list of Plants Reported as Natural Hosts of *Phytophthora ramorum.* All three hosts were found *P. ramorum*-positive in the UK. USDA APHIS is researching the findings and anticipates adding these plants to APHIS *P. ramorum* associated host list soon. (9/06)

Canada has added five new genera (*Loropetalum, Distylium, Manglietia, Parakmeria,* and *Ilex)* to the CFIA *P. ramorum* host list. These additions are the result of positive confirmations from the species: *Loropetalum chinese*, *Distylium myricoides*, *Manglietia insignis*, *Parakmeria lotungensis*, and *Ilex purpurea*. *Ilex* and *Manglietia* plants not only displayed leaf spots, but also some dieback. All of the confirmations came from container plants grown in a polyhouse. APHIS is reviewing the findings and anticipates adding these plants to the APHIS *P. ramorum* associated host list in the near future. (9/06)

REGULATIONS

The Canadian nursery industry revised its *P. ramorum* Nursery Certification Program. Key components of the program include annual sampling and testing, training, and independent audits. As the program moves into its 2nd year, new significant scientific information has necessitated even more rigorous BMPs to be implemented by August 2006.

In British Columbia, the program has been piloted to over 250 nurseries. Participants include Christmas tree growers and ornamental nurseries of all sizes.

The new mandatory BMPs include: an integrated pest management program, with scheduled fungicide spraying if required; addressing the issue of water levels and puddling on the soil surface, as well as leaf wetness to minimize sporulation and infection; a defined cleaning and disinfection policy to ensure proper sanitation, minimizing risk of infection from outside sources; and segregation of the three 'high risk' genera – *Rhododendron*, *Camellia*, and *Viburnum*, with additional, rigorous BMPs required to produce these plants. (2/06)

On 2/3/06, USDA APHIS issued an update to the Trace-Forward Protocol for Nurseries that Received Plant Material Shipped from a Confirmed *P. ramorum*-Infested Nursery. The new protocol establishes a set of procedures that are used to determine if a nursery that has received plants from a *P. ramorum*-positive nursery acquired infected nursery stock. (3/06)

New Zealand issued a public notice on 3/8/06 addressing nursery stock importation concerns, including risk mitigation measures and the host list for *P. ramorum*. With the exception of high-value plants for which the risk of *P. ramorum* is mitigated alternatively (such as Vaccinium), hosts of *P. ramorum* are only permitted to be imported from countries recognized by New Zealand as Pest-Free Areas, which currently include: Australia, Canada, Israel, and South Africa. According to the New Zealand Ministry of

Agriculture and Forestry (MAF), as the host list expands, current risk mitigation options threaten to cut-off trade to large amounts of plant propagative material. However, there are programs in Europe and North America which have been developed in line with ISPM 10: Requirements for the Establishment of Pest Free Places of Production and Pest Free Production Sites, to certify places of production as free from *P. ramorum*. MAF is considering permitting imports of plant material from these programs. (4/06)

Taiwan, Penghu, Kinmen, and Matsu issued a public notice on 3/29/06 proposing a draft amendment of the "Quarantine Requirements for the importation of plants or plant products." Among the changes is the designation of *P. ramorum* as a quarantine pest, whereby: "The importation of living plants (excluding flowers, fruits and seeds) of its hosts will be prohibited." Regions or countries affected by the amendment include: Belgium, the British Channel Islands, Denmark, France, Germany, Ireland, Italy, the Netherlands, Norway, Poland, Slovenia, Spain, Sweden, Switzerland, the UK, Canada (British Columbia), and the US (CA, FL, GA, OR, WA). (4/06)

On 4/27-28/06 in Orlando, FL, USDA APHIS *P. ramorum* program representatives convened a "mini" science panel to address soil and water treatments, as well as pathways of *P. ramorum* infection. A group of scientists and regulators from across the country discussed best known methods to mitigate *P. ramorum* in soil and water as well as the primary pathways of infection from soil or water to plants. The meeting was prompted by recent detections in standing and flowing water. (5/06)

WSDA and USDA APHIS officials met 4/18-19/06 to develop options for addressing a WA nursery soil detection and detection of *P. ramorum* in an adjacent stream. A monitoring strategy and treatment alternatives were formulated. (5/06)

Based on new scientific findings that *P. ramorum* infects tanoak beyond the bark and into the wood, USDA APHIS is considering an update to the *P. ramorum* federal quarantine. If revised, it is anticipated that the federal order will likely prohibit the movement of unprocessed *Lithocarpus densiflorus* (tanoak) wood from areas quarantined for *P. ramorum*. The current regulation prohibits the movement of tanoak bark chips, forest stock, and mulch, while allowing movement of wood and wood products (such as firewood logs and lumber) by requiring a certification that the wood is free of bark. (6/06)

USDA APHIS has issued the federal "Protocol for Forest and Wildland Environments." The document provides guidance and instruction for new *P. ramorum* wildland detections in the US, and covers survey, communications, diagnosis/confirmation, sampling, treatments, regulatory action, and other topics. Under the new protocol, immediate federal notification and state action are required if suspect positives are detected in forests and wildland areas outside the currently quarantined area and are more than 25 miles from a generally infested location. Once confirmed, an eradication or suppression program should be implemented. Failure to do so could result in a federal quarantine on the county. Additionally, failure of a state to initiate regulatory action would necessitate a federal quarantine on the entire state. (7/06)

USDA APHIS has updated the CNP. Effective 9/1/06, any newly confirmed *P. ramorum*-positive nurseries must comply with the new version of the protocol. (9/06)

MANAGEMENT

CA's most extensive *P. ramorum* experimental treatment and suppression project to date is underway in Humboldt County. The treatments are taking place on CA State Parks property in the Jay Smith Road area north of Miranda in Southern Humboldt County. The project will include the removal of infected tanoak, California bay laurel, and madrone trees, as well as the pruning of coast redwood trees in a 50-acre area. Based on permits and crew availability, pile burning and potential under-burning are tentatively planned for fall, 2006. Monitoring of project results will continue for several years. With landowner permission, several other sites in the southern Humboldt region are scheduled for treatment in the coming months. (2/06)

The COMTF is interested in establishing and coordinating a Conservation Committee to address *P. ramorum*-related conservation issues. With the establishment of *P. ramorum* in CA's coastal forests, and the continued expansion of land affected by the pathogen, this group will focus on addressing the issues park and land managers, as well as owners are facing, including such topics as management and suppression, the role of *P. ramorum* in CA's forests, and its ecological impacts. In addition, the group will discuss linkages of SOD to other conservation concerns (fire suppression, invasive species). To find out more about this developing committee, please attend the first organizational meeting at the Carmel Mission Inn on 3/21, during the COMTF March meeting lunch break. (2/06)

The Midpeninsula Regional Open Space District, with cooperation from a local Saratoga Boy Scout Troop, has installed bike tire brushes and boot scrapers at the Monte Bello and Saratoga Gap Open Space Preserve trailheads in an effort to slow the spread of *P. ramorum*. Bicyclists and hikers are encouraged to use the cleaning apparatuses on tires and boots upon entering and exiting the infested preserves. District signs explaining how to use the brushes and scrapers have been posted at the sites where the devices have been installed. The Midpeninsula Regional Open Space District board also approved a $350,000 budget for special SOD projects over the next 10 years, including a resistance study, limited application of fungicide on heritage trees, and development of a collaborative research grant. (2/06)

The GAO report, "Invasive Forest Pests: Lessons Learned from Three Recent Infestations May Aid in Managing Future Efforts," (GAO-06-353, April 2006) has been published. The report evaluates the federal response to three invasive forest pests: Asian longhorned beetle, emerald ash borer, and *P. ramorum*. Recommendations to the Secretary of Agriculture included: expanding efforts to monitor forest health conditions to include urban areas, regularly updating and publishing management plans for pests that include status information and funding needs, and implementing written procedures that broadly define when and how to operate science panels for specific pests. (6/06)

The House of Representatives Resources Committee's Subcommittee on Forests and Forest Health held an oversight hearing 6/21/06 on "Forest Insects and Disease; A Growing National Problem, 'GAO Report on Invasive Forest Pests.'" (7/06)

The creation of a Sonoma County SOD Task Force is underway to facilitate the crafting and implementation of a *P. ramorum* management program in an effort to protect County forests and address fire threat concerns. To assist with planning, CDF personnel have flown the local area, mapping current mortality levels, and they will also be assessing fire risks. Researchers also plan to assess inoculum levels in heavily impacted areas, and plans for an educational outreach campaign are being developed. On the ground strategies for public and private lands have been discussed, in addition to options for utilizing and/or destroying trees. (9/06)

The GAO posted a 6/21/06 invasive species report "Invasive Forest Pests: Recent Infestations and Continued Vulnerabilities at Ports of Entry Place U.S. Forests at Risk" (GAO-06-871T) to their website. (9/06)

A North Coast SOD Advisory Group convened its 4th annual meeting in Eureka on 9/14 to discuss *P. ramorum* management strategies and impacts. The group, comprised of local public and private landowners and land managers, as well as regulatory officials and state and federal legislative staff, worked on coordinating a strategic 2006/07 *P. ramorum* program for the area. Support to continue slow the spread efforts was great, as it was recognized that the recent spread in Humboldt County is still relatively small and isolated compared to the size of the county, and current infestations could serve as inoculum sources which could ultimately impact thousands of uninfested acres. Topics addressed at the meeting included 1) responding to *P. ramorum* outbreaks, 2) improving public understanding of SOD and Humboldt County treatment efforts, 3) expanding cooperator and financial support, and 4) refining educational messages targeted at Mendocino, Humboldt, and Del Norte Counties.

At the meeting, the group viewed the current status of the disease and the experimental control efforts implemented over the last 8 months, on over 120 acres. These experimental silvicultural treatments are located at the known edges of Humboldt County's *P. ramorum*-infested area. They were carried out by UCCE Humboldt-Del Norte, with CDF, California State Parks, Southern Humboldt Fire Safe Council, CalTrans, and private landowners and contractors. The treatments were conducted on four parcels involving a replicated study of California bay laurel and tanoak removal in combination with pile and broadcast burning. The controlled burns are planned for this fall. With these targeted tree removal efforts, researchers hope to reduce pathogen sporulation and change the conditions of the stands to discourage pathogen persistence. On each of the properties, additional treatments, designed as case study experiments, were also included. (10/06)

The Midpeninsula Regional Open Space District hosted the first COMTF Conservation Committee meeting for land managers on 9/7/06 in Los Altos, CA. More than 30 representatives from a variety of agencies attended, including the BLM, CA

Dept. of Fish and Game, CA State Parks, East Bay Regional Park District, East Bay Municipal Utility District, Elkhorn Slough National Estuarine Research Reserve, MMWD, San Mateo County Parks, Sonoma County Open Space, and the US Fish and Wildlife Service. The day-long meeting provided a forum for information sharing and needs gathering, and resulted in a prioritized list of needs for land managers dealing with *P. ramorum* issues in both park and wildland settings. The top five research priorities identified were: pathogen spread; fire risk and use of fire for disease prevention and treatment; resistant stock development; and the need for additional treatment options. Training and assistance with ecological issues was also identified as a priority. This list will be used to help prioritize future research needs as well as identify educational outreach opportunities. (10/06)

On 10/31 and 11/1, COMTF members from UCCE, CDF, and California State Parks burned 45 acres of public and private land to complete an experimental silvicultural treatment for managing the spread and persistence of *P. ramorum* in southern Humboldt County. The goal of these treatments is to test several options for long-term management. The prescribed fires complemented removal of infected vegetation by hand crews the previous spring and were added to explore all possible options for effective control.

On the first property, a State Parks parcel located along the Avenue of the Giants, the team took advantage of the first possible fall burn day. They burned one management unit from which bay and tanoak had been removed early in the year and also one unit from which bay, tanoak, and small-diameter madrone had been removed. The team hopes that the fire will have consumed infested litter and infected seedlings and sprouts. Ongoing monitoring will determine pathogen persistence for at least the next two years.

On the second property, a private parcel northwest of the Garberville airport, the team burned three units: one that was infested but untreated, one that matched the bay/tanoak removal unit at the State Parks property, and one treated with a modified fuel hazard reduction prescription. Much of the ground fuels had been removed as part of the bay/tanoak removal and fuel hazard reduction treatments. Additionally, although no significant rain had fallen up to this point in the season, elevated humidity levels on the second day greatly increased fine fuel moisture content. This meant that the fire burned best in the untreated unit; scattered patches of the other two units burned. The team will attempt to burn again at the Garberville site if weather conditions permit during the coming months.

These prescribed fires will provide valuable experience and knowledge for the ongoing effort to determine the best methods of managing *P. ramorum* persistence on forested north coast properties. (11/06)

An update on SOD in OR: SOD was first discovered in OR forests in 7/01. Since then OR cooperators have been attempting to eradicate the pathogen by cutting and burning all infected and nearby host plants. On most sites (except BLM ownership) herbicides are used to kill sprouts and prevent stump-sprouting.

During the first four years of the eradication effort, the number of new infested sites and infected trees decreased each year. That trend ended in 2005 (the 5th year of the eradication program) when the number of trees and the number of new infested acres increased compared to the previous year.

In 2006, 35 new infested sites (139 infected tanoak trees) were discovered. Two of the new sites occurred outside of the quarantine zone: one was 1 mile to the east, and the other 1.5 miles to the west of the boundary. Each of these sites was more than 2 miles from a known infested site. Most of the other new sites were small (less than 1 acre) and scattered near the center of the quarantine zone along the North Fork Chetco River and its tributaries. The largest new site covered 10 acres and contained more than 40 infected trees. In addition to the new sites, six existing eradication sites were expanded to include infected trees that were found near their perimeters.

The new infection is attributed to two consecutive years of unusually wet springs and early summer weather. The 2006 weather, in particular, appeared to favor long -distance spread of *P. ramorum.*

Several of OR's treated sites appear to be pathogen-free two years after treatment, and the pathogen has not expanded from these sites. Repeated aerial surveys, ground surveys, and stream monitoring throughout southwest OR have failed to detect the pathogen in forests beyond the area near the town of Brookings. Efforts to eradicate the pathogen from OR forests likely will continue for several years. (12/06)

While Congress has not passed the FY 2007 federal budget, it is anticipated that the USDA FS PSW Region SPP FHP SOD program budget will be approximately $600,000. For the first time, the Region will be issuing a SOD management and monitoring RFP in 2007. In past years the Region awarded over $1 million for SOD survey, treatment, and education without a formal RFP process. The competitive RFP will be issued soon. (Note that this request excludes funding for research. The PSW 2007 *P. ramorum*/SOD Research RFP is still pending the finalization of the FS Research budget.) (12/06)

NURSERIES

The first 2006 *P. ramorum*-positive CA nursery was identified on 1/23/06. The find was made on a *Camellia japonica* in a Los Angeles County production nursery that only sells plants to local landscapers and does not ship plant material. This nursery was also found *P. ramorum*-positive in 2005. (2/06)

CDFA identified four *P. ramorum*-positive nurseries during February, bringing CA's 2006 total number of positive nurseries to five. One of the finds was at a Contra Costa County production facility where two *Camellia* plants were found to be infected. The nursery, also found to be infested in 2004, does ship interstate. A second confirmation was made at an Alameda County retail nursery. *P. ramorum*-positive plants included *Camellia* and *Pieris*. The nursery, also found positive in 2005, ships bareroot, non-host nursery stock interstate. A third confirmed location was a Nevada County retail

nursery with *P. ramorum*-positive *Camellia*. The nursery was also found positive in 2004 and 2005, and does not ship interstate. The fourth confirmation came from *Camellia japonica* samples taken at a Napa County retail nursery. Also found positive in 2004, the nursery does not ship interstate. (3/06)

CA had three new *P. ramorum*-confirmed nurseries during the month of March. One of the finds was a Sacramento production facility that only ships non-host material interstate. All positive plants identified at the site were *Camellia* spp. A second confirmation was made at an Alameda County retail nursery. All plants identified as positive were *Camellia* spp. The nursery, also found positive in 2004 and 2005, does not ship out of CA's quarantined area. The third confirmed site, a Solano County production facility, was found to have infected *Camellia japonica*. The nursery does not ship interstate. (4/06)

FL confirmed two *P. ramorum*-positive nurseries in March. Of the 23 *Camellia* plants found infected, five species were identified, including *japonica*, *sasanqua*, *sinesis*, *hiemalis*, and *vernalis*. Both of the Tallahassee nurseries were also found positive in 2004 surveys. Investigations have not determined if the pathogen was re-introduced or if it has persisted at the nurseries in soil and/or water since the initial findings. (5/06)

CA had four *P. ramorum* nursery confirmations during the month of April. **One of** the facilities was a San Mateo County producer that was also found positive in 2004 and 2005. The positive plants identified were *Camellia sasanqua* 'Jean May,' *Camellia sasanqua* 'Showa-No-Sake,' *Camellia sasanqua* 'Kanjiro,' and *Camellia sasanqua* 'Bonanza.' This nursery is not under compliance and does not ship out of the quarantined counties. A second facility identified was a Sacramento County producer that was also found positive in 2005. The positive plant identified was a *Camellia japonica* 'Mrs. Charles Cobb.' This nursery does ship interstate, but only to Nevada. A third confirmation was made at an Alameda retail nursery. The positive plants identified were *Rhododendron* 'Edith Bosley,' *Camellia japonica* 'Tom Knudsen,' and *Pieris japonica* 'Shojo.' This nursery was also found positive in 2005. The nursery does not ship any plants out of the quarantined counties. The final April confirmation was at another Alameda County retail nursery. The positive plant was a *Camellia japonica* 'Debutante.' The nursery does not ship plant material out of the quarantined counties and has not been found *P. ramorum*-positive in the past. The addition of these 4 confirmed facilities brings the State's 2006 total to 12. (5/06)

ODA has completed approximately 50 percent of its *P. ramorum* 2006 Federal Order inspections. As of 4/14, 15,025 samples have been collected from 267 sites and analyzed for the presence of the pathogen. *P. ramorum* was found at 4 (2%) of the sites surveyed with *Phytophthora* species detected at 45 (17%) of the surveyed sites. Three of the confirmed sites were small grower facilities located in Polk, Washington, and Lane Counties. The fourth confirmed site was a small retail facility located in Lane County. Plants found positive included *Camellia japonica*, *Rhododendron*, and *Pieris japonica*. Two of the small grower nurseries did ship a small volume of host plants out-of-state;

trace-forward investigations are underway. The USDA CNP has been initiated at all sites. (5/06)

Six CA nurseries were identified as *P. ramorum*-positive in May, bringing the State's 2006 total number of positive nurseries to 18. The first confirmation came from a self-reporting Humboldt County retail nursery that was found to have *P. ramorum*-positive *Viburnum tinus*. The nursery does not ship out of the quarantined area. A second confirmation was made at a Marin County retail nursery. *P. ramorum*-positive plants included: *Camellia sasanqua* 'Setsugekka,' *Camellia japonica* 'Mathotiana Supreme,' and *Camellia japonica* 'Colonel Firey.' The nursery, also found positive in 2003 and 2004, is not under a compliance agreement and does not ship intra- or interstate. A third identified nursery was a Mendocino County production facility. All positive samples were *Rhododendron*; the nursery does not ship interstate. A fourth *P. ramorum*-positive nursery, identified in Los Angeles County, was found to have a positive *Laurus nobilis*. The nursery does ship interstate; consequently, their compliance agreement has been suspended. The fifth CA nursery found positive in May was a Tulare County production facility found to have *P. ramorum*-positive *Camellia japonica* 'Kramer's Supreme.' The nursery does not ship interstate. The final CA nursery confirmation was made at a Santa Clara County production nursery where *Magnolia grandiflora* was found *P. ramorum*-positive. This is the first detection of *P. ramorum* on *Magnolia grandiflora* in a US nursery. The nursery does ship interstate, and was also found *P. ramorum*-positive in 2005. (6/06)

CA had six *P. ramorum*-positive nursery confirmations in June. Two production facilities, one in Sonoma County and the other in San Joaquin County, were found to have *P. ramorum*-positive camellias. The Sonoma County facility was previously found positive in 2004, and does not ship interstate. The San Joaquin County facility had been found positive in 2005, and does not ship interstate either. Two Sacramento County retail facilities were also found *P. ramorum*-positive. One of the nurseries is not under a compliance agreement and does not ship to other nurseries. Previously found positive in 2005, the other nursery is also not under a compliance agreement and is not currently shipping plants. A fifth CA site in Sonoma County was found to have *P. ramorum*-positive *Camellia sasanqua*. This retail facility was also found positive in 2004 and 2005. The nursery does not ship out of the quarantined counties or to other nurseries. The final confirmed nursery was a San Mateo County retail facility. The positive plant was an established CA bay laurel. This nursery has not previously been positive for *P. ramorum*, is not under compliance, and does not ship out of the quarantined counties. These new finds bring the State's 2006 total number of *P. ramorum*-positive nurseries to 24, compared to 52 positive finds at this time in CA in 2005. (7/06)

ODA has completed its *P. ramorum* Federal Order certification for 2006. The certification program inspections began on 2/15 and were completed on 6/30. During this time, ODA staff collected 62,045 samples from 1,112 growing areas to test for the presence of the pathogen. *Phytophthora* species were detected at 16 percent of the surveyed sites. *P. ramorum* was found at 13 nurseries (about one percent). The USDA

CNP has been enacted at all 13 sites. A total of 938 host and 1,000 non-host nurseries in OR now qualify for certification under the Federal Order certification program.

ODA has also completed its statewide survey of Christmas tree plantations. A total of 4,480 samples were collected from 113 plantations for pathogen testing. No *P. ramorum* was found at any of the plantations surveyed, although *Phytophthora* species were detected at two percent of the sites. This is the fifth consecutive year no *P. ramorum* has been found in OR Christmas trees.

A *P. ramorum* survey of OR retail nurseries is now underway. ODA plans to survey and sample approximately 150 retail nurseries that sell *P. ramorum*-susceptible plants. (7/06)

An AL retail nursery was confirmed positive for *P. ramorum* 7/11/06. The infected *Camellia* sp. was found on the nursery cull pile during a *P. ramorum* National Nursery Survey inspection. (8/06)

A *P. ramorum*-positive *Viburnum mariesii* was found on 7/18/06 at a small IN retail outlet as the result of a trace-forward investigation from a production nursery in Clackamas County, OR. (8/06)

***Pieris* sp. 'Mountain Fire' was confirmed *P. ramorum*-positive 7/25/06 at a GA retail** nursery during a trace-forward investigation from a production nursery in Clackamas County, OR. (8/06)

***P. ramorum*-positive *Syringa vulgaris* 'Ludwig Spaeth' was confirmed positive on** 7/25/06 at a small ME retail nursery as a result of a trace-forward investigation from a production nursery in Clackamas County, OR. (8/06)

A retail nursery in MS was confirmed *P. ramorum*-positive on 6/7/06. The infected *Camellia* sp. was identified during a *P. ramorum* National Nursery Survey inspection. Trace-back investigations are being conducted. (8/06)

***P. ramorum* was detected on *Camellia japonica* 'Kramer's Supreme' at a Napa** County, CA production nursery in July. The nursery is not under a compliance agreement and does not ship out of the quarantined area. The addition of this facility brings CA's 2006 total number of confirmed nurseries to 25, compared to 53 in 7/05. (8/06)

CA had one *P. ramorum*-positive nursery identified in August. The San Joaquin County producer was found to have five positive Camellia varieties ('Jean May,' 'Bonanza,' 'Showa-no-sakae,' 'Chansonette' and 'Nuccio's Pearl'). Also found *P. ramorum*-positive in 2004, the nursery does not ship interstate and their compliance agreement has been suspended. (9/06)

Forty-six states have reported *P. ramorum* National Nursery Survey results (AK, IA, MO, and Puerto Rico are not participating.) and WI is looking for *P. ramorum* as part of

their regular nursery inspection. To date, 3,513 nurseries have been visited and 95,295 samples collected. Out of the samples collected, 352 have been confirmed *P. ramorum*-positive. (10/06)

A Santa Cruz County production nursery was identified as *P. ramorum*-positive on 9/28. The positive growing media sample was collected from a camellia pot during follow-up CNP activities. The nursery is not under a compliance agreement and does not ship out of the quarantined counties. This nursery also tested *P. ramorum*-positive in 2003, 2004, and 2005. The potted camellia from which the sample was taken was located directly under a California bay laurel tree. The samples submitted from the bay tree are pending. (11/06)

CFIA detected *P. ramorum* at four retail garden centers (two sites have the same owner) in early September and October. The origin of the pathogen at all four locations is unknown. *P. ramorum* was found at the sites in 2004, and all four sites were found free of the pathogen in 2005. All four centers source plants both locally and from the US and were sampled as post eradication sites due to previous detections. The plants found infected were *Rhododendron* 'Catawbiense Boursault,' 4 *Rhododendron* spp., *Hamamelis* 'Diane,' and *Viburnum bodnantense* 'Dawn.' At each retail garden center, once infected plants were confirmed, all host plant material was detained for sampling. Infected plant blocks were destroyed and a 90-day quarantine of host plants 10 meters beyond the destruction blocks was instituted. During the quarantine period, plants, soil, and water at each of the centers will continue to be sampled and tested.

To date in 2006, over 173 wholesale and retail nurseries have been surveyed as part of the Canadian National *P. ramorum* survey. While more than 35,000 samples have been collected for testing, the four retail nurseries have been the only positive confirmations as a result of the survey.

Eradication efforts also continue at a wholesale nursery in Pitt Meadows, BC, where *P. ramorum* was detected in late 2005. As a repeat site, stringent controls have been implemented, restricting the movement of all plants (both host and non-host), soil, and water. Currently, arrangements are made at this site to treat soils that have tested positive for *P. ramorum*. All testing of plants in the 100 m. perimeter of this site have been negative. Sampling and monitoring of this site will continue until the 90-day quarantine period on the 10 m. of host plants beyond the destruction blocks have taken place and no *P. ramorum* is found. Trace-forwards from this nursery site this year have detected two residential/commercial landscape sites with 11 positive *Gaultheria shallon* plants. (11/06)

A CA production nursery in Santa Clara County was confirmed to have *P.* *ramorum*-positive *Vancouveria planipetala* (redwood ivy) on 11/9/06. The nursery is not currently under compliance and does not ship or intend to ship out of the quarantined counties. (12/06)

Sixty-two sites in 11 states have nursery-related *P. ramorum* detections. Positive findings by state are: AL (1), CA (28), CT (1), FL (2), GA (1), IN (1), ME (1), MS (1), OR (13), PA (1), and WA (12).

OTHER ISSUES OF INTEREST

NAPPO has issued a Phytosanitary Pest Alert for *P. hedraiandra* in response to the identification of this pathogen in MN nurseries. This is the first time *P. hedraiandra* has been found in the US and North America. The detections were made as the result of samples taken from *Rhododendron* during the US *P. ramorum* National Nursery Survey in 2005. Koch's postulates were successfully completed with *P. hedraiandra* isolates and the *Rhododendron* cultivar 'Mikkeli'.

First identified in the Netherlands from a *Viburnum* spp. sample in 2001, this pathogen has since been found in Spain and Italy on *Viburnum tinus*. Currently, the only known hosts for this pathogen are certain Rhododendron and Viburnum species. Symptoms on known hosts include branch dieback, basal stem cankers, root rot, and leaf spots. With an unknown host range and distribution, as well as symptoms closely resembling other *Phytophthoras*, diagnosis is difficult. Additionally, it is not known if symptoms vary between hosts, as is often the case with *Phytophthoras*. It is likely that this pathogen moves much like other known *Phytophthoras*, through infected host plants, infested soil, rain splash, and possibly infested irrigation water. (2/06)

***Phytophthora*-related stem bleeding on horse chestnut has been reported since the** 1970s in the UK and since the 1930s in the US. Until recently, these bleeding cankers were considered to be uncommon; however, over the past several years, such symptoms have greatly increased in the UK, and have also been found in the Netherlands, France, and Germany. Visible symptoms on affected trees include bleeding on stems, and sometimes scaffold branches. With the surge of infection, closer investigations suggest that bacteria could be responsible for the increased numbers of horse chestnut trees displaying these symptoms.

Both young and mature trees are at risk of succumbing to the unknown disease, with young trees dying in as little as a few years and mature trees becoming disfigured, and ultimately dying if infection is severe enough. Although an extensive survey has not been conducted in the UK, Forestry Commission Research scientists estimate that 35,000 – 50,000 trees are currently affected, and likely a few thousand have died. Affected trees have been found in parks, public gardens, lining streets, and in historically significant areas. Trees in towns and rural areas are found to be infected at a higher rate than those found in woodlands, with *Aesculus*. x *carnea* found infected more often than *A. hippocastanum*. *A. + dallimorei*, a rare hybrid chestnut, is also susceptible to the infection causing the bleeding canker.

Culturing from the margins of the infected tissue in England has revealed the presence of several potential pathogens, yet a species of gram-negative fluorescent bacterium is consistently present in cultures. Therefore, it is suspected that the bacterium may be the cause of the cankers. Experiments to confirm suspicions are being conducted by scientists.

Surveys in the Netherlands have found that 1/3 of all horse chestnut trees are now affected by this infection, with researchers there also working on identifying the cause. So far, their findings indicate a species of bacterium in the *Pseudomonas syringae* complex is causing the outbreak. (2/06)

NAPPO's Phytosanitary Alert System has issued an update for *Phytophthora alni* (Alder *Phytophthora*), including information on potential new hosts. A lethal root and collar rot disease of alder (*Alder* sp.), this pathogen was first observed in the UK in the early 1990s, but not described until 2004. Since initial observations, this pathogen has been found impacting alder in many other parts of Europe, particularly central Europe. The disease poses a significant threat to natural and managed alder stands in Europe and threatens the stability of riparian ecosystems. The disease likely poses a similar threat to alders on other continents, including North America and Asia.

Research has shown the pathogen to be associated with spread via waterways and infected nursery stock, and is believed to have a relatively poor long-term soil survival rate. While *P. alni* has only been reported under natural conditions from *Alnus* species (*Alder cordata, A. glutinosa, A. incana,* and *A. rubra*), greenhouse inoculation studies suggest that other tree species may be susceptible, including walnut (*Juglans regia*) and chestnut (*Castanea sativa*), as well as wild cherry seedlings (*Prunus avium*). (4/06)
NAPPO has issued an alert regarding the first detection of *Phytophthora tropicalis* in the continental US. (4/06)

A final summary report on "Determining the susceptibility of key/dominant UK heathland species to *Phytophthora kernoviae*" has been published by the UK's CSL. (10/06)

FUNDING AND LEGISLATION

Passed by the House of Representatives on 5/23/06, the Agriculture Appropriations Bill included $7.73 million for SOD. Funds were earmarked for research and control, with $6.5 million to USDA APHIS and $1.2 million to the USDA ARS. The Senate is expected to consider the Bill later this month. (6/06)

The Midpeninsula Regional Open Space District (MROSD) will provide $60,000 over the next three years for a tanoak *P. ramorum* resistance project. Interested in regional parks, land trusts, and open space districts working more closely with one another to address SOD, the MROSD Board members, manager, and staff hope their efforts can serve as a model for others. The agreement will be between the MROSD and the USDA FS PSW Research Station, and will support research at UC Berkeley (Dodd, Garbelotto, and Hayden) and USDA FS PSW (Jessica Wright). (12/06)

RESOURCES

The COMTF 2006 Sudden Oak Death Program has been posted to the Task Force Publications page. Task Force goals are defined in the document, as well as the work outlined to fulfill addressing those goals. (2/06)

Presentations from the 3/21/06 COMTF-wide annual meeting, "*Phytophthora ramorum*: A Management and Research Update," are now posted to the COMTF website. (4/06)

EU RAPRA has expanded public assess to their website. Now available are images of host symptoms as well as a natural host database and a database of potential hosts identified in laboratory settings. (4/06)

The OakMapper has been expanded, providing visitors with even more options for accessing SOD/*P. ramorum* spatial data. In addition to the traditional OakMapper website and static map downloads, confirmations can also be viewed via Google Maps and Google Earth, allowing for high spatial resolution imagery in areas with *P. ramorum*, such as viewing dead crowns around *P. ramorum* confirmation points. (5/06)

"Regulated Forest Hosts" and "Sudden Oak Death Guidelines for Forestry" documents have been posted to the COMTF website. The forest host document lists federally regulated hosts and associated hosts found in CA's forests and the forestry guidelines provide BMPs for those working in forests affected by *P. ramorum*. (5/06)

Goheen, E.M., Hansen, E., Kanaskie, A., Osterbauer, N., Parke, J. Pscheidt, J., Chastagner, G. April 2006. Sudden Oak Death and *Phytophthora ramorum*: A Guide for Forest Managers, Christmas Tree Growers, and Forest Tree Nursery Operators in Oregon and Washington. Oregon State University Extension Service, EM8877. 16 pgs. (6/06)

A "*Phytophthora ramorum* and *Phytophthora kernoviae*: Key findings from UK research" has been posted to the DEFRA website. While some of the DEFRA-funded studies are complete, others are new or ongoing, and intended to be referenced as provisional information to be amended as more information is obtained. (9/06)

CFIA has updated Canada's Plant Health Risk Assessment "*Phytophthora ramorum*: causal agent of sudden oak death, *ramorum* blight, *ramorum* bleeding canker, *ramorum* (shoot) dieback." The document rates the overall risk of *P. ramorum* as 'high' for BC and 'medium' for Southern Ontario, Quebec, and the Maritime Provinces. The 126-page document is not posted to the Internet, but is available upon request through the CFIA, Plant Health Division, Horticulture Section; Floor 3, Room 3103; 59 Camelot Drive; Ottawa, Ontario; K1A 0Y9 (Tel.: 613/221-4342 Fax: 613/228-6603). (9/06)

"A field guide to insects and diseases of California oaks" is now available from the USDA FS PSW Research Station. To request ONE FREE copy, contact Richard Schneider at Rocky Mountain Research Station, Publishing Services via email: rschneider@fs.fed.us (include your full mailing address in block format), fax: (970) 498-1122, or phone: (970) 498-1392. When ordering, ask for: Swiecki, Tedmund J. and Bernhardt, Elizabeth A. 2006. A field guide to insects and diseases of California oaks. Gen. Tech. Rep. PSW-GTR-197. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture. 151 p. The publication is also available on the PSW website. (11/06)

"SOD Guidelines for California Landscapers and Gardeners" is now available on the COMTF website. The guidelines include information on pathogen biology, regulations, hosts, symptoms, and diagnosis and treatment, as well as general oak care, plant selection and placement, plant removal, debris disposal, and proper sanitation. (11/06)

A question and answer session from a UK *P. ramorum* and *P. kernoviae* stakeholders meeting in September 2006 has been posted to the DEFRA website. Reports on findings and future research, EU and national updates, the Forestry Commission survey, the Corwall situation, and a summary of the micropropagation project are posted along with the questions and answers that were addressed verbally. (11/06)

WSU has released a new online P. ramorum training module for nurseries. Currently available in Spanish, an English version will also be posted soon. The presentation provides training on *P. ramorum* symptoms as well as management considerations aimed at keeping the pathogen out of nurseries. Also discussed are ways to reduce economic impacts if *P. ramorum* is detected and how to reduce the risk of spreading the pathogen into the natural and urban landscape. (12/06)

OUTREACH ACTIVITIES

2/8 – Oregon *P. ramorum* public hearings on updates to the state's *P. ramorum* quarantine and nursery certification programs; Salem OR

2/9– Second Oregon *P. ramorum* public hearing on updates to the state's *P. ramorum* quarantine and nursery certification programs; Brookings, OR

2/18 – Marin County Open Space Sudden Oak Death Hike; Baltimore Canyon Preserve, Larkspur, CA

3/8 – COMTF Spring Training: Detection and Control of *P. ramorum* in Non-infested Counties; San Luis Obispo, CA
3/14 – SOD Spreads in West Marin: A Community Meeting; Point Reyes Station, CA

3/21 – "*Phytophthora ramorum*: A Management and Research Update" COMTF-wide Annual Meeting; Carmel, CA; Included the first organizational meeting of the COMTF Conservation Committee

3/22 – APHIS *P. ramorum* Program Review; Carmel, CA

3/23 – Half-day SOD field trip to Pfeiffer Big Sur State Park; Carmel, CA

4/4 – 6 - The Fifth National Integrated Pest Management Symposium, "Delivering on a Promise;" A mini-symposia titled "*P. ramorum* (SOD) in Wildlands and Nurseries;" St. Louis, MO

4/26 – COMTF Spring Training: A management update for *P. ramorum*/SOD: Symptoms, Regulations, Treatment, and BMPs; Ukiah, CA

5/4 – SOD Aerial Monitoring Informational Meeting; Intended for community members and landowners to learn more about the program and importance of participation; Templeton, CA

5/5 – SOD Aerial Monitoring Informational Meeting; Intended for community members and landowners to learn more about the program and importance of participation; San Luis Obispo, CA

5/7 – 2006 Bringing Back the Natives Garden Tour; Bay Area, CA

7/20 – "Forest Management in Western Sonoma County: SOD (*P. ramorum*) and Other Issues for Small Landowners" Workshop; Guerneville, CA

10/9 – 12 – 6th California Oak Symposium, "California's oaks: Today's challenges, tomorrow's opportunities;" Rohnert Park, CA; Intended for academics, planners, conservation practitioners, foresters, arborists, land owners, and oak enthusiasts; SOD field trip on 10/9

10/19 – Christmas Tree Research Field Tour; Los Gatos, CA; Offered by Gary Chastagner and WSU Puyallup Research and Extension Center staff, in cooperation with the COMTF

10/30 – *P. ramorum* Nursery Training Session; Riverside County, CA

10/31 – *P. ramorum* Nursery Training Session; Los Angeles County, CA

11/6 – 9 – 2006 Annual Gypsy Moth Review; St. Louis, MO; *P. ramorum* discussed the afternoon of 11/8

11/14 – 15 – 2006 Annual Meeting of the CA Forest Pest Council; Woodland, CA; Featured an update on SOD and efforts to control *P. lateralis*, *P. ramorum*, and *P. cinnamomi* on a rare manzanita

PERSONNEL CHANGES

Allison Wickland has been hired by Dave Rizzo, Associate Professor of Plant Pathology at UC Davis**,** to coordinate the Big Sur SOD Management Project. Allison has worked on *P. ramorum* in the Rizzo lab as a technician and graduate student for nearly five years, and examined the ecology of *Phytophthora* species in forests dominated by coast live oak for her MS thesis. In her duties, Allison will be identifying potential locations for ecology plot network sites and pilot project locations for management actions. She will also be conducting public outreach and visiting private properties.

Allison currently works out of the Big Sur Land Trust office, and can be reached at acwickland@ucdavis.edu. (2/06)

The USDA FS FHP's SOD Monitoring Outreach Coordinator position has been filled by Lisa Bell. Lisa has worked with plant pathologists surveying SOD in CA's coastal forests as well as in the Rizzo lab at UC Davis and has outreach experience conducting conservation education. In her new role, she will coordinate the aerial and ground-based monitoring program outreach efforts, act as liaison between summer field crews and office personnel, coordinate landowner contacts, and provide field crews with information for field surveys. (2/06)

Kerri Frangioso has been hired to work with Allison Wickland as co-coordinator of the Big Sur SOD Adaptive Management Project, under the direction of Dave Rizzo, UC Davis**.** Kerri previously worked on SOD issues in the Big Sur region for the WCS, studying the ecological effects of SOD on acorn production in redwood-tanoak forests. While a significant component of Kerri's job will be community outreach in the Big Sur area, she and Allison will also begin fieldwork in April, establishing long-term ecological monitoring plots throughout the Big Sur region. Both Kerri and Allison work out of the Big Sur Land Trust office on the Monterey Peninsula, and may be reached at: (831) 620-1098. Kerri can also be reached via email at: kfrangioso@ucdavis.edu. (4/06)

COMTF Chair Mark Stanley is now working with CA's Resources Agency and the CA Biodiversity Council to develop a coordinated response plan for current and future invasive pests statewide. Participants will likely include state, federal, and non-government organization partners currently working on invasive species issues. Similar to the COMTF, this effort will bring various resources and expertise together, in an effort to develop coordinated response strategies to minimize the economic, social, and environmental impacts of invasive species in California. (4/06)

Ken Wong replaced Rob Ormrod in April as the CFIA *P. ramorum* National File Leader. Prior to his new position, Ken led the *P. ramorum* survey and eradication programs at the field-level in the Vancouver/lower mainland area. Ken may be reached at (604) 666-7777 or via email at: wongkw@inspection.gc.ca. (5/06)

The UCCE office in Marin County hired Deborah Zierten for a summer intern position. Under the direction of Janice Alexander, COMTF Educational Outreach Coordinator, Deborah's primary duty will be to update the COMTF website as well as other educational outreach materials. (6/06)

The Canadian Forest Service (CFS), Pacific Forestry Center, in cooperation with CFIA, has hired Marianne Elliott for a two-year position to analyze the potential for biocontrol of *P. ramorum*. One goal of the two-part project will include examining a large collection of *P. ramorum* isolates from the US, Europe, and Canada, and screening for those that might contain dsRNA viruses or other cytoplasmic elements. This research is being conducted in conjunction with the CFIA plant virology group in Sidney, BC. The second component of the project involves screening and testing chemical fungicides

and biocontrol agents on *P. ramorum*-infected leaves of several plant hosts common in BC nurseries, landscapes, and forests. A subset of the isolates from the first study covering a range of pathogenicity, and from both mating types, will be used. It is hoped that the results of these studies will provide information on factors that affect pathogenicity in *P. ramorum* and methods for screening large numbers of control agents for managing the disease. The Principal Investigators for the project are Simon Shamoun, CFS, and Delano James and Saad Masri, CFIA. For more information on the project, contact Marianne Elliott at: (250) 363-0715 or via email at: melliott@pfc.cfs.nrcan.gc.ca. (6/06)

Daniel Huberli, a post doc. in the UC Berkeley Garbelotto lab, has accepted a Research Fellow position in the "Centre for *Phytophthora* Research and Management" at Murdoch University in AU. In his new position, he will be looking at the effect of stress on the efficacy of phosphite uptake to control *P. cinnamomi*. He will also be supervising a project working on determining the susceptibility of AU plants to *P. ramorum*. Daniel may be reached by phone at: +61 8 9360 6486 or via email at: D.Huberli@murdoch.edu.au. (8/06)

John Bienapfl left his position with the UC Davis Rizzo Lab as the *Phytophthora* diagnostician to pursue a PhD in plant pathology at the University of Minnesota. John may be reached in St. Paul via email at: biena003@umn.edu. (9/06)

Kamyar Aram has been hired to replace John Bienapfl. **Kamyar received his MS in** Horticulture with a minor in Plant Pathology from Cornell University in 2002. His thesis study was focused on the use of compost for nitrogen fertility and suppression of soilborne fungal and oomycete diseases in vegetable production. Kamyar can be reached via email at: kamaram@ucdavis.edu or by phone at: (530) 754-9894. (9/06)

Phil Cannon was hired in October as the USDA FS SPF FHP Regional Plant Pathologist. Phil worked for a number of years with Boise Cascade Corporation and as a consultant with private companies. He also worked with the United States Agency for International Development and Food and Agriculture Organization. Located at the Regional Office in Vallejo, Phil will be running the SPF FHP SOD program. He may be reached at: (707) 562-8913 or pcannon@fs.fed.us. (11/06)